

Applicant : Min Zhu, et al.
Appl. No. : 09/751,807
Examiner : Kenneth R. Coulter
Docket No. : 16440.4002

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

1. (currently amended) A computer system for fault-tolerant distributed collaborative computing, the system comprising:

a plurality of server computers connected to a plurality of client computers via a global-area computer network;

a high-speed direct connection link connecting the plurality of server computers; and

a plurality of server programs ~~computer program~~ executable by the server computers configured to conduct a plurality of on-line conferences among an arbitrary number of client computers connected to an arbitrary number of the server computers via the global-area network and the high-speed direct connection link, wherein the plurality of server programs comprise: ~~computer program comprises computer instructions for:~~

at least one meeting zone configured to connect one of the arbitrary number of client computers to one of the plurality of on-line conferences, each meeting zone comprising:

a process manager configured to monitor the plurality of server programs and the plurality of server computers for software and hardware failures and to spawn a new server program in the event that an existing server program fails,

a meeting database configured to store user information and state information for the plurality of on-line conferences,

a zone manager configured to provide a communication channel between the plurality of server programs and configured to monitor the plurality of server programs,

a plurality of meeting managers configured to monitor the plurality of server programs, wherein the plurality of meeting managers and the process manager mutually monitor each other for software failures, further wherein the plurality of meeting managers monitor a load on each of the plurality of server computers, and further wherein the plurality of meeting

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managers store state information for the plurality of on-line conferences in the meeting database,

a collaborative server configured to host at least one of the plurality of on-line conferences,

a ping server configured to receive and forward requests from a user to join an on-line conference,

a log server configured to communicate with a plurality of meeting managers via the zone manager and configured to log users joining and leaving an on-line conference,

a license manager configured to monitor users in an on-line conference to determine whether a user is authorized to participate in an on-line conference, and

an application server configured to enabling users of an on-line conference to share desktops.

~~conducting an on-line conference among an arbitrary number of the client computers connected to an arbitrary number of the server computers via the global area network and the high-speed direct connection link;~~

~~monitoring for a respective heartbeat message from each of the server computers involved in the on-line conference;~~

~~if no respective heartbeat message is received from one of the server computers involved in the on-line conference, disconnecting that server computer from the on-line conference;~~

~~connecting another of the server computers to the on-line conference; and resuming the on-line conference.~~

Claims 2-26 (canceled)

27. (new) The computer system of claim 1, wherein the plurality of client computers communicate with at least one of the plurality of server computers through a virtual socket

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operating over a hypertext transport protocol.

28. (new) The computer system of claim 1, wherein the plurality of server programs further comprise a web zone configured to enable a client computer to access the plurality of server programs via a web browser installed on the client computer.

29. (new) The computer system of claim 1, wherein the plurality of server programs further comprises a plurality of ping servers, wherein the ping server that is fastest to respond to a user's request to join an on-line conference forwards the request to the on-line conference.

30. (new) The computer system of claim 1, wherein the plurality of meeting managers are further configured to adjust a particular load corresponding to one of the server computers if the particular load reaches a pre-determined threshold, wherein adjusting the load comprises reducing the load on existing server computers conducting the on-line conference and spawning new processes on additional server computers for conducting the on-line conference.

31. (new) The computer system of claim 1, wherein the application server is further configured to enable multiple users to share control of desktops.

32. (new) A computer system for fault-tolerant distributed collaborative computing, the system comprising:

a server means for connecting a plurality of client computers to a plurality of server computers via a global-area computer network;

a server means for conducting a plurality of on-line conferences between the plurality of client computers via the plurality of server computers;

a server means for monitoring the plurality of server computers for software and hardware failures and to spawn a new server program in the event that an existing server program fails;

a server means for storing user information and state information for the plurality of on-line conferences;

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a server means for communicating between the plurality of server computers;

a server means for monitoring a load on each of the plurality of server computers;

a server means for receiving and forwarding requests from a user to join an on-line conference,

a server means for logging users joining and leaving an on-line conference;

a server means for monitoring users in an on-line conference to determine whether a user is authorized to participate in an on-line conference, and

a server means for enabling users of an on-line conference to share desktops.

33. (new) The computer system of claim 32, wherein the plurality of client computers communicate with at least one of the plurality of server computers through a virtual socket operating over a hypertext transport protocol.

34. (new) The computer system of claim 32, further comprising a means for enabling a client computer to access the plurality of server programs via a web browser installed on the client computer.

35. (new) The computer system of claim 32, further comprising a means for adjusting a particular load corresponding to one of the server computers if the particular load reaches a pre-determined threshold, wherein adjusting the load comprises reducing the load on existing server computers conducting the on-line conference and spawning new processes on additional server computers for conducting the on-line conference.

36. (new) The computer system of claim 32, further comprising a means for enabling multiple users to share control of desktops.

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37. (new) A method for fault-tolerant distributed collaborative computing, the method comprising the steps of:

connecting a plurality of client computers to a plurality of server computers via a global-area computer network;

conducting a plurality of on-line conferences between the plurality of client computers via the plurality of server computers;

monitoring the plurality of server computers for software and hardware failures and to spawn a new server program in the event that an existing server program fails, wherein the plurality of server computers mutually monitor each other;

storing user information and state information for the plurality of on-line conferences;

communicating between the plurality of server computers;

monitoring a load on each of the plurality of server computers;

receiving and forwarding requests from a user to join an on-line conference,

logging users joining and leaving an on-line conference;

monitoring users in an on-line conference to determine whether a user is authorized to participate in an on-line conference, and

enabling users of an on-line conference to share desktops.

38. (new) The method of claim 37, wherein the plurality of client computers communicate with at least one of the plurality of server computers through a virtual socket operating over a hypertext transport protocol.

39. (new) The method of claim 37, further comprising the step of enabling a client computer to access the plurality of server programs via a web browser installed on the client computer.

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40. (new) The method of claim 37, further comprising the step of adjusting a particular load corresponding to one of the server computers if the particular load reaches a pre-determined threshold, wherein adjusting the load comprises reducing the load on existing server computers conducting the on-line conference and spawning new processes on additional server computers for conducting the on-line conference.

41. (new) The method of claim 37, further comprising the step of enabling multiple users to share control of desktops.